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A suggested teaching model based on brain-based learning to develop secondary stage students' critical reading skills and self-efficacy

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Abstract

The current study aimed to determine the effectiveness of a brain-based teaching model on developing critical reading skills and self-efficacy among secondary stage students. The basics upon which this model was built were determined, the teacher's guide and the student's worksheet were prepared. A critical reading skill test and self –efficacy questionnaire were prepared. The study had two groups: one experimental group and one control group (second secondary grade students). The tools of the study were pre adminstrated on both the experimental group and control group. The chosen critical reading skills were introduced according to the suggested teaching model. The tools were post applied on the experimental group and the control group. The obtained data from the pre and post administration of the tools were analyzed. The statistical analysis of the data assured large effect of the suggested brain-based teaching model on developing the critical reading skills and self-efficacy level of the experimental group students.

Key words: brain-based learning, critical reading skills and self-efficacy.

نموذج تدريسى مقترح قائم على التعلم المستند إلى الدماغ لتنميه مهارات القراءه الناقده و الكفاءه الذاتيه لدى طلاب المرحله الثانويه

المستخلص

هدف البحث الحالى إلى تحديد فاعلية نموذج تدريسي قائم على التعلم المستند الى الدماغ في تنمية مهارات القراءه الناقده والكفاءه الذاتيه لدى طلاب المرحله الثانويه (الصف الثانى) وحددت أسس بناء النموذج ووضع تصور لمراحله و إجراءاته ، و في ضوءه اعد دليل للمعلم و أوراق عمل للطالب ، كما اعد اختبار للقراءه الناقده و مقياس للكفاءه الذاتيه ، و اختيرت مجموعتى البحث التجريبيه و الضابطه من طلاب مدرسه العباسيه الثانويه للبنات. و طبقت أدوات البحث على المجموعه التجريبيه و الضابطه قبليا ثم تم تدريس مهارات القراءه الناقده باستخدام النموذج التدريسى المقترح للمجموعه التجريبيه، ثم طبقت أدوات البحث على المجموعه التجريبيه و المجموعه الضابطه بعديا قامت الباحثه بمعالجه البيانات احصائيا و أثبتت نتائج البحث الاثر الكبيرللنموذج التدريسي المقترح في تنمية مهارات القراءه الناقده و الكفاءه الذاتيه لدى طالبات المجموعه التجريبيه.

الكلمات المفتاحيه: التعلم المستند الى الدماغ، مهارات القراءه الناقده و الكفاءه الذاتيه.

A suggested teaching model based on brain-based learning to develop secondary stage students' critical reading skills and self-efficacy

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Introduction

Learning English has become a must in the twenty first century as it is considered one of the most widely used languages in the world. It is the language of international communication in all fields. It is the language most generally associated with higher education and research. English also provides a foundation for lifelong language learning and for personal enjoyment and enrichment.

Reading is one of the four essential English language skills. It is an important source through which students can discover and interact with the world around them. Developing reading skills is of crucial importance to language learners. Learners who do not succeed at reading are unlikely to do well at their study. Hong (2000) states that the first and foremost job of school is to teach learners to read. Teaching reading should enable almost every student to read fluently, to reach high levels of comprehension and to enjoy and learn from reading.

Reading means more than decoding the letters and recognizing the meaning of words. Success at school and in social life also requires more than knowing the meanings of the words in a text. Many students who can comprehend a literary text have difficulty in understanding the intention and the idea the author means to convey. These students only interpret what the words are but they cannot understand what they mean. In other words, critical reading should be presented to learners at different stages. Secondary stage learners need to develop critical reading skills as they are at the doorstep of the university and then practical life.

Understanding the words and comprehending the meaning are two basic components of reading. The students are not only expected to read the lines but also to read between the lines. Readers do not only record the message but also construct the text meaningfully, (Cooper et al., 1998). These behaviors expected of a reader are related to the acquisition of critical reading skills by the reader, because critical reading refers to comprehending the gist of the text, assessing the conclusions made in the text, understanding the supportive ideas, and evaluating the reasonable points, (Hellyer et al., 2011). Thus, critical readers can read the texts by thinking about them objectively and profoundly.

A look at the national standards for teaching English as a foreign language set by NAQAAE reveals that the secondary learners are expected to be able to skim and scan complex text for general meaning or to determine subject matter or organization. They are also expected to be able to guess meaning of new words from context, demonstrate culture in independent reading for pleasure, and analyze information to determine relevancy of main ideas to supporting details. Learners should be able to ask and respond to high level thinking questions which connect new ideas to personal experience, draw conclusions about context, events, characters and setting from written texts and read critically to interpret and evaluate the content of long reading texts. NAQAAE (2009:pp.12-14)

In spite of the importance of critical reading skills for language learners, it is not enough for them to know them. English language learners need more than knowing critical reading skills to be successful readers. There should a bridge between knowledge and action, i.e., the learner's beliefs about himself and his abilities, his beliefs about his ability to use knowledge effectively. These indicate the importance of the learners' self- efficacy.(Tilfarliolu &Cinkara ,2009)

Self-efficacy is currently one of the most popular belief systems in educational psychology. It is an attribute that should be nurtured and enhanced because it contributes tremendously to positive feelings of accomplishment and well-being. Self-efficacy motivates the learner to do school activities and face different academic pressure. It strengthens the learners' self-cofidence (Raofi et al.,2012).

Considering these accounts regarding self-efficacy in terms of "critical reading," it is understood that critical reading ability requires an individual to have a considerable level of self-efficacy concerning the task of reading. When faced with a complex or long text, individuals with high levels of self-efficacy for reading will tend to sustain the task of reading and perform the requirements of critical reading, instead of quitting the reading activity. In this respect, it is believed that individuals first should be provided with critical reading ability, and then develop favorable senses of self-efficacy regarding that ability of critical reading (Acikel ,2011).

The human brain and the way it works to learn occupied the thinking educationalists for a long time. The adult human brain weighs about three pounds (1300-1400 grams) and is made of water (78 percent), fat (10 percent), and protein (8 percent) (Jensen, 1998). Although the brain is about 2 percent of an adult's weight, it consumes about 20 percent of the body's energy and its primary source of energy is blood which supplies nutrients like glucose, protein, trace elements, and oxygen to the brain (Sousa, 2001)and (Sprenger,2002). While the left hemisphere is

responsible for analytical and verbal skills, such as reading, writing, and mathematics, the right hemisphere is the source of spatial and artistic kinds of intelligence (Nunley,2011).

Brain-based learning refers to teaching methods, lesson designs, and school programs that are based on the latest scientific research about how the brain learns, including such factors as cognitive development—how students learn differently as they age, grow, and mature socially, emotionally, and cognitively. (Miller,2003)and (Brodnax,2004)

Brain-based learning is a way of activating all the parts of the brain during the learning process. Schools who have implemented brain-based teaching and learning have shown increases in student achievement over a period of time. Effective teachers use brain-based techniques to keep students actively engaged in the learning process. When students are actively engaged in the learning process, both hemispheres of their brains can be activated to increase learning. While most students prefer one learning style, modality, or hemisphere over the other, activating both left-brain and right-brain activities can increase student achievement. The never-ending search for better teaching practices in this area has led educators to the work of key authors such as Wolfe (2001), Erlauer (2003), Slavkin (2004), Jensen (2005), Caine,Caine (2006), Ur-Rehman(2011) and Akyurek & Afacan(2013). Most of these authors would agree with those teachers who contend they already incorporate some aspects of brain-based learning into their classrooms. However, they would also suggest that the pathway to more effective implementation follows a process of continual research, or sustained inquiry, which involves collaboration, planning, action, evidence-gathering, and reflection on practice.

Although critical reading is important for secondary stage English language learners and it is a part of every unit in their syllabus, some teachers are not aware of that as shown in the results of an interview conducted by the researcher. Critical reading and its subskills are not specified for them. Learners memorize new vocabulary and memorize answers of the questions without really reading critically. Consequently, they lack self-efficacy and doubt their abilities. The current study hopefully contributes to solve this problem by using the suggested brain-based learning model.

Context of the Problem

The need to conduct the current study springs from the following sources:
1- Several studies have been implemented in Egypt to investigate students' weakness in reading skills and suggested different approaches to improve them. Amer's (2009) tried group work in presenting reading

activities and found it effective in developing reading skills. Abohadid (2003) investigated developing students' higher order reading comprehension skills by using free reading and results indicated that practical implications of the free reading in public libraries develops higher order skills. Mohamad (2002) also suggested that the reading materials used in literature circles developed students' comprehension "in terms of predictions, connections and activation of prior knowledge. Other studies such as El-Didi (2001), Abdelmoaty (2002) and Abdel-Moghni (2011) emphasized that EFL critical reading and reading comprehension skills are neglected in Egyptian classes. They also highlighted the need for adopting better teaching strategies to improve EFL learner's reading skills. Similarly, Ibrahem (2007) pointed to the poor level of reading comprehension among students at the second year of preparatory governmental schools.

Some studies also showed that when EFL learners lack self-efficacy, their progress in acquiring the language skills is affected. Tilfarliolu and Cinkara (2009) showed in their study that self-efficacy influenced students' performance and that students who had high self-efficacy tend to be more successful. Jennifer (2007) assured in her study the positive effect of self- efficacy in developing reading and writing. In his study Mizumoto (2012) showed that self- efficacy is considered an important element in teaching and learning vocabulary as well as affecting self-regulation of learning languages. Greta (2007) also recommended the necessity of developing self-efficacy to improve language learning.

2- The researcher administrated a critical reading test to 3٧ second year, secondary stage students in Ben el Sarayat secondary school for girls in the first term of the academic year 2015-2016 (The test is in Appendix:2).The test consisted of two passages followed by ten questions for each passage. Every question was given one mark if the answer was correct. Twenty eight students (75.7%) did not pass the test as they scored less than half the total mark of the test. Results of this test assured the existence of weakness in second secondary grade students' critical reading skills .A self-efficacy questionnaire also was given to the same group of students. It consisted of fifteen positive and negative statements .Results showed that thirty students (81.1%) were found to lack self-efficacy (The self-efficacy questionnaire is in Appendix: 3).

3- The researcher interviewed eight English teachers from Ben el Sarayat and Abbassia secondary schools and asked them about the difficulties they face in teaching critical reading passages ,the method they follow in teaching them and their suggestions to improve the students' critical reading skills. The answers of the teachers showed that most of their students have difficulties in understanding and answering questions on

critical reading passages. Five teaches stated that they make students memorize the new words and also the answers of the questions to pass the exam.

Problem of the study

The problem of the current study was the weakness of second secondary grade students' English critical reading skills and in their low self-efficacy level. In an attempt to solve this problem, the study designed and experimented a suggested brain-based teaching model to identify its effectiveness on developing second secondary grade students' English critical reading skills as well as improving their self-efficacy.

The purpose of the study

The purpose of the study was to develop some English critical reading skills and improve self-efficacy level of second secondary grade students.

Questions of the study

The study sought to provide answers to the following main question:
What is the effect of a brain-based teaching model on developing English critical reading skills and improving self-efficacy of second secondary grade students?

From this main question the following sub-questions emerged:
1- What are the critical reading skills required to be developed for the second grade secondary school students?
2- What are the theoretical bases and features of the brain-based teaching model for developing English critical reading skills and improving self-efficacy?
3-What is the effect size of the teaching model on developing each of second secondary students' English critical reading sub-skills?
4-What is the effect size of the teaching model on improving second secondary students' self-efficacy?

Hypotheses of the Study

This study attempted to verify the following hypotheses:
1- There will be a statistically significant difference between the mean scores of the critical reading skills of the experimental and control groups in the post administration of the test in favor of the experimental group.
2- There will be statistically significant differences between the mean scores of the experimental group in the pre and post administration of the critical reading skills test in favor of the post test.
3-There will be statistically significant differences between the mean scores of the experimental and control groups in the post test on each critical reading sub-skill: identifying the main idea, differentiating between fact and opinion, making inferences, comparing and contrasting and summarization favor of the experimental group.

4- There will be statistically significant differences between the mean scores on the pre and post administration of the test on each critical reading sub-skill: identifying the main idea, differentiating between fact and opinion, making inferences, comparing and contrasting and summarization for the experimental group in favor of the posttest.

5- There will be statistically significant differences between the mean scores of the self-efficacy questionnaire of the experimental and control group in the post administration of the questionnaire in favor of the experimental group.

6- There will be statistically significant differences between the mean scores of the experimental group in the pre and post administration application of the self-efficacy questionnaire in favor of the post administration.

Aims of the study

The present study aimed at:

1- Constructing a suggested brain-based learning teaching model.

2- Identifying the effect of a brain-based learning teaching model on developing second secondary school students' English critical reading skills and increasing their self-efficacy.

Variables of the Study

1-Independent variable

A suggested brain-based teaching model to develop English critical reading skills and self- efficacy among second secondary grade students.

2-Dependent variables

1- Second secondary grade students' critical reading skills.

3- Second secondary grade students' self-efficacy.

Delimitations of the Study

The present study is delimited to:

1- Participants of second secondary grade students randomly nominated from Al Abbassia secondary school for girls in Cairo in the first term of the academic year 2015-2016. Second secondary grade students are supposed to have suitable mental and language maturity to acquire critical reading skills in the light of brain-based learning.

2- The critical reading skills to be targeted are identifying the main idea, differentiating between fact and opinion, making inferences, comparing and contrasting and summarization.

3-Self-efficacy in its following dimensions: self-awareness, perseverance, tendency and interaction and achievement.

Design of the Study

•The design of the current study is the two groups' pre-post testing experimental design.

Significance of the Study

The present study is expected to achieve the following:

1-The theoretical importance: the study will present theoretical frame about brain-based learning: its theory, brain structure, defining brain-based learning, its principles and characteristics and the stages of brain-based learning. Definition of reading comprehension skills is presented as well as critical reading. Reading taxonomies are discussed. The section about self-efficacy discusses its definition, processes, sources and effects.

2- The practical importance for:

a) EFL students

- Increasing the number of students who read independently and critically English texts in the secondary stage.

- Encouraging students to be more positive and active in the learning process.

b) EFL Educators

-Encouraging teachers to assign brain-based out of class activities as well as in class activities to help students read more often using critical reading skills.

- Encouraging teachers to model critical reading and consequently develop students' self-efficacy.

- Encouraging school librarians to supply libraries with interesting English books suitable for every age group.

- Motivating school leaders to encourage critical reading and inaugurating book clubs at schools.

c) Curriculum Developers

Attracting curriculum developers to enrich text books with activities which would enhance students' critical reading and self-efficacy through extensive reading assignment.

Definition of terms

The following terms focuses on their operational definitions in the current study:

1- **Teaching model**: A group of organized and sequenced stages that include teaching and executive procedural steps. It shows the instructor and learner's role in every step, aiming at stimulating the learning process and achieving the identified objectives. The suggested model in the current study has five stages (preparation-acquisition-elaboration-integration-evaluation).

2**- Brain-based learning:** Instruction depends on the results of research in human brain components and functions and its relation to the teaching\learning process. It aims at adapting the educational situation to suit second secondary stage students' brains to help them to read

critically. It aims at developing some critical reading skills and self-efficacy.

3- **Critical reading**: In the present study, critical reading is defined in the ability of second secondary grade students to identify the main idea, differentiate between fact and opinion, make inferences, compare & contrast and summarization.

4-**Self-efficacy:** Second secondary grade students' beliefs about their inner abilities to read critically. It includes realizing themselves, their abilities and the persistence and effort they do to face the challenges and difficulties to read critically. It is going to be measured by using the self-efficacy questionnaire designed by the researcher for this purpose.

Theoretical background

(1)Reading comprehension

The reading process is viewed from three different perspectives.

1. Bottom-up theory.
2. Top-down theory.
3. The interactive theory.

Partnership for reading (2005) defines reading comprehension as understanding a text that is read, or the process of constructing meaning from a text. Comprehension is a construction process because it involves all of the elements of the reading process working together as a text is read to create representation of the text in the reader's mind (Brassell and Rasinski ,2008).

Teaching reading is an important requirement of English language teachers. Teaching reading goes through three stages: pre-reading, while reading and post-reading stages. Medina (2008) illustrates the activities teachers can use through the three reading stages as follows:

1. Pre-reading activities:

The pre-reading activities are tasks intended to construct background knowledge. The teacher becomes a bridge builder between what students already know about a concept and what they need to know in order to understand a particular text.

2. While-reading activities:

The aim of these activities is to help students to understand the specific content and to perceive the rhetorical structure of the text.

3. Post-reading activities:

Post-reading tasks are intended to verify and expand the knowledge acquired in the reading stage. They lead the learners to discuss and analyze issues presented in the reading.

Reading taxonomies

Basaraba D. et al., (2013) emphasizes three main levels or strands of comprehension: literal comprehension, inferential comprehension and evaluative comprehension.

1. The first level, literal comprehension, is the most obvious. Comprehension at this level involves surface meanings. At this level, teachers can ask students to find information and ideas that are explicitly stated in the text. In addition, it is also appropriate to test vocabulary. Some skills at this level are:

- Knowledge of word meaning
- Recall of details directly stated or paraphrased in own words.
- Understanding of grammatical clues- subject, verb, pronouns, conjunctions and so forth.
- Recall of main idea explicitly stated.

2. The second level or strand is inferential comprehension. At this level, students go beyond what is said and read for deeper meanings. They must be able to read critically and analyze carefully what they have read. Students need to be able to see relationships among ideas, for example how ideas go together and also see the implied meanings of these ideas. It is also obvious that before our students can do this, they have to first understand the ideas that are stated (literal comprehension). Interpretive comprehension includes thinking processes such as drawing conclusions, making generalizations and predicting outcomes. At this level, teachers can ask more challenging questions. It includes the following skills:

- Reasoning the information presented to understand the author's tone, purpose and attitude.
- Inferring factual information, main idea, comparison, cause-effect relationships not explicitly stated in the passage.
- Summarization of story content.

3. Finally, the third level of comprehension is critical or evaluative comprehension whereby ideas and information are evaluated. Critical evaluation occurs only after our students have understood the ideas and information that the writer has presented.

- Analyzing and evaluating the quality of written information in terms of some standards.
- Personally reacting to information in a passage indicating its meaning to the reader.

Literal comprehension has no longer been the aim of reading in the modern world. Readers should not be overtly influenced by what they read taking the printed word as an absolute fact. They need to view themselves as readers who question, interpret, think, analyze, discover

relationships and evaluate rather than readers who struggle to understand literally what is written. Therefore, developing critical reading skills of students has been of great importance (Makhyoun,2008).

Critical reading

Information acquisition has become an important objective for individuals and societies in the twenty-first century. In order to use knowledge effectively and productively, one should not only understand and interpret it correctly but also question its accuracy, effectiveness and necessity. In this respect, the function and quality of reading activity becomes a critical issue in the acquisition of these skills. Individuals should be able to interpret the author's ideas, compare them with others on the same topic, and criticize the assertions after completing the reading task comprehendingly. The individual is expected to form and strengthen his/her own idea by investigating various ideas on the same topic. Knott (2010) stated it is important to train students so they can use the knowledge and skills successfully in tests at schools; however, it should be more important for students to be critically interested in the texts and reflect this into their lives. At this point, it is quite important to improve students' mechanical reading skills to critical reading skills.

Critical reading is the ability to read between the lines. It includes the ability to discuss, analyze, evaluate what is read, draw inferences, and arrive at conclusions based on evidence. Knott (2010) adds that to read critically is to make judgments about how a text is argued. McDonald (2004) defines critical reading as an alternative way of reading that goes beyond the "typical approaches to reading such as information processing or personal response" .Reading is an active process, not a passive one. Reader must engage with the text. Critical reading is an important precursor to critical writing.

Tomasek (2009) points out that students can critically read in a variety of ways: When they raise vital questions and problems from the text, when they gather and assess relevant information and then offer plausible interpretations of that information, when they test their interpretations against previous knowledge or experience and current experience, when they examine their assumptions and the implications of those assumptions, and when they use what they have read to communicate effectively with others or to develop potential solutions to complex problems. Secondary stage learners are believed to have reached enough mental maturity to possess at least some critical reading skills.

Critical reading skills

Researcher such as Abdelmoatry (2002),Bardakci (2010) and Abdel Moghni (2011) mentioned many critical reading skills such as:
- examine the evidence or arguments presented;

- check out any influences on the evidence or arguments;
- check out the limitations of study design or focus;
- examine the interpretations made; and
- decide to what extent you are prepared to accept the authors' arguments, opinions, or conclusions.

   Critical reading is a decision-making process. It requires that the reader asks many questions while s/he reads. When she reads critically, s/he notices not only what is written but how it is written. All authors have a purpose when they write. Your job as a critical reader is to figure out the author's purpose.

   Critical reading sometimes involves reading twice: once to become familiar with the material and a second time to analyze it. During the second reading, reader asks questions like the ones below and makes notes in the margins of the reading or on paper. The more you read critically, the more s/he will automatically ask questions like these while s/he reads.

Roe, et al. (1995) state the following skills of critical reading:
- Identifying the author's purpose
- Evaluating the validity of material
- Evaluating the use of propaganda
- Evaluating the author's logic
- Evaluating the author's use of language

Abdullah (1998) stated nine core critical reading subskills identified are listed below according to their difficulty levels, sequenced from the easiest to the most difficult. They are the ability to:
-identify similarities and differences
-evaluate inductive inferences
-identify facts and opinions
-evaluate generalisations
-evaluate strengths of arguments
-identify biased statement,
-identify relevant and irrelevant materials
-identify author's motives
-recognize hidden assumptions

   The present study benefited from the previously mentioned background in designing the checklist of critical reading skills.

(2)Brain-based Learning

   Learning is the brain's natural function, moreover it has a limitless ability to learn regardless age, sex, nationality or cultural background. Human brain has many inner abilities to discover patterns, to store knowledge, to self –learn and correct itself from experience and also

never ending ability to create and invent. In spite of the numerous and vast abilities of the human brain, we find different theories and methods related to learning due to the lack of certain knowledge about how the brain works .Lately, we began to know the abilities, processes and how the brain works which helped educationalists to benefit from its abilities and improve learning. Gardner's book Frames of Mind: The Theory of Multiple Intelligences (1983) taught educators around the globe to understand the actual connections that the brain has with learning. Beginning in the late 1980s and the early 1990s, thousands of American teachers became intensely interested in learning about the brain-based multiple intelligences and finding multiple ways to reach their increasing numbers of diverse learners. The enormous interest in the brain-based multiple intelligences helped to bring about the new field of Brain-Based Learning (BBL). Current research in the field of BBL is gleaned from the combined work of neurologists, biologists, psychologists, educators, and physicians. They strive to extrapolate the most current research data on the brain and provide us with much information as the following one to apply to teaching and learning.

Brain structure

Houzel (2009) states that there are roughly 86 billion neurons in our brains. But unlike the common saying, people do not just use 10% of them; they use most of them all of the time. Neurons are the cells in the brain that convey information about the world around us, help us make sense of the world, and send commands to our muscles to act. Learning can change the shape of a neuron, what that neuron projects to, and its signaling efficiency.

Most neurons are made up of the following parts: the nucleus (which contains the genetic instructions), the soma (or cell body), dendrites (branch-like structures which receive information from other neurons), axons (long tubular pathways which send information to other parts of the brain), and an (axonal) presynaptic terminal. The presynaptic terminal connects to other neurons via synapses. Many axons are surrounded by myelin, essentially sheaths which help axons quickly send signals over long distances.

The brain is made of three main parts: the forebrain, midbrain, and hindbrain. The forebrain consists of the cerebrum, thalamus, and hypothalamus (part of the limbic system). The midbrain consists of the tectum and tegmentum. The hindbrain is made of the cerebellum, pons and medulla. Often the midbrain, pons, and medulla are referred to together as the brainstem.

The Cerebrum: The cerebrum or cortex is the largest part of the human brain, associated with higher brain function such as thought and action.

The cerebral cortex is divided into four sections, called "lobes": the frontal lobe, parietal lobe, occipital lobe, and temporal lobe.

Frontal Lobe- associated with reasoning, planning, problem solving ,abstract thought processes and physical reaction .Parietal Lobe- associated with movement, orientation, recognition, response to internal stimuli, sensory combination and some language and reading functions .Occipital Lobe- associated with visual processing and reading. Temporal Lobe- associated with perception and recognition of auditory stimuli, memory, and speech.

The Cerebellum: The cerebellum, or "little brain", is similar to the cerebrum in that it has two hemispheres and has a highly folded surface or cortex. This structure is associated with regulation and coordination of movement, posture, and balance.

Limbic System: The limbic system, often referred to as the "emotional brain", is found buried within the cerebrum.

Brain Stem: Underneath the limbic system is the brain stem. This structure is responsible for basic vital life functions such as breathing, heartbeat, and blood pressure.

If the brain is split right down the middle into two equal parts, it would have a right and left hemisphere. Although equal in size, these two sides are not the same, and do not carry out the same functions. The left side of the brain is responsible for controlling the right side of the body. It also performs tasks that have to do with logic, such as in science and mathematics. On the other hand, the right hemisphere coordinates the left side of the body, and performs tasks that have do with creativity and the arts. Some educationalists advocated the idea that one of the brain hemispheres masters the other one. They believe that once it is known which part has the upper hand, learning which suits its functions to guarantee the best benefit can be designed. Others think that dividing the responsibilities between the two hemispheres is not absolute and that they interact continuously. Jensen (2005) believes that the brain works as a whole, sometimes it works in right or left but it works and achieves best when it works as a whole to connect the two hemispheres. The current study advocates Jensen's opinion and developed a brain-based teaching model which activates the brain as a whole and suits both kinds of learners. Learning and teaching need the activity of the two sides of the brain, right and left, and the processes that occur require the activity of the two sides depending on the type of the presented information.

It can be concluded that it is necessary to present learning experience that suits the functions of the two sides of the brain together. It should match the nature of information process in each side. Visual and verbal

activities should be presented, they should include abstract and concrete ideas and details as well as total. This activates the two sides of the brain and gives it the chance to work as a whole either in the light of functional specialization for the two hemispheres of the brain and the dominance of one of them or in the light of the holistic view of the brain functions. According to Pedersen (2011) and Lepper (2011), learning more effectively took place when connections were made between the right and left hemispheres of the brain. The left brain was associated with cognition, while the right brain was associated with creativity. Activating both hemispheres of the brain encouraged effective learning and student engagement.

Defining brain based learning (BBL)

Brain-Based Learning can be viewed as techniques gleaned from research in neurology and cognitive science used to enhance teacher instruction. These strategies can also be used to enhance students' ability to learn using ways in which they feel most comfortable, neurologically speaking.

Jensen (2000) defines BBL as "learning in accordance with the way the brain is naturally designed to learn" (p. 6). Perhaps the most important aspect of BBL is that it encompasses and combines specific types of research-based academic interventions as well as applied aspects of emotional learning. A basic component of brain-based learning is that our emotions influence our ability to learn. Our brains are constantly striving to make connections between intellect and emotions.

BBL involves accepting the rules of how the brain processes, and then organizing instruction bearing these rules in mind to achieve meaningful learning Caine and Caine (1994). BBL is a way of thinking about the learning process. It is a set of principles and a base of knowledge and skills through which we can make better decisions about the learning process (Jensen, 2008). The objectives of brain research studies include teaching to individual differences, diversifying teaching strategies, and maximizing the brain's natural learning rocesses(Alfilimbani,2014) and (Tileston, 2005).

Altiti (2014) assured that BBL is teaching strategies and techniques which use the information about the human brain and how it works in organizing lessons. Saleh (2011) defined BBL as a holistic approach to teach using neurology and focuses on the way the brain learns naturally. Connell (2009) agrees with them adding that BBL can be used to support the teacher in his efforts and to increase the student's abilities to use suitable ways to learn.

Duman (2010) defined BBL as a kind of learning depending on the principles of the brain work to improve the learning process, increase

achievement and giving equal chances to individual differences. Kiedinger (2011) added that BBL develops students' ability to solve problems, helps them to achieve meaningful learning and support their self- dependence.

Based on the findings of neuroscience, BBL guides according to the principles and workings of the brain to improve the best way of learning, increase academic achievement, and provide equal opportunities for individual differences.

The principles of brain based learning theory

Since the 1990s, educators and psychologists such as Caine and Caine (1994), Jensen (2005), Sousa (2006), Armstrong (2009) and Caine et al. (2009) have been forerunners in the BBL movement. These authors have helped with disseminating neurological research into research-based academic best practices. They contributed in defining the principles of BBL. These principles are:

1. The brain is a parallel processor: The brain performs many tasks simultaneously, including thinking and feeling.

2. Learning engages the entire physiology: The brain and the body are engaged in learning.

3. The search for meaning is innate: The greater the extent to which what we learn is tied to personal, meaningful experiences, the greater and deeper our learning will be. Caine and Caine (1994)

4. The search for meaning occurs through patterning: "The brain is designed to perceive and generate patterns and it resists having meaningless patterns imposed on it". Caine and Caine (1994)

5. Emotions are critical to patterning: Our emotions are brain based; they play an important role in making decisions. In the groundbreaking The Emotional Brain, Khttab (2013) clearly explains how the emotional neural passageways influence the neural passageways needed for academic and scholarly work.

6. The brain processes parts and wholes simultaneously: The left and the right hemisphere have different functions, but they are designed to work together.

7. Learning involves both focused attention and peripheral perception: People hold general perceptions of the environment and pay selective attention to various parts of it.

8. Learning always involves conscious and unconscious processes: There is interplay between our conscious and our unconscious. "One primary task of educators is to help students take charge of their conscious and unconscious processing" (Caine and Caine, 1994).

9. We have at least two different types of memory: spatial (autobiographical) and rote learning (taxon memory). The taxon or rote memory systems consist of "facts and skills that are stored by practice and rehearsal" (Caine and Caine ,1994). Spatial, or autobiographical, memory "builds relationships among facts, events, and experiences" (Caine and Caine, 1994).

10. Learning is developmental: Children, and their brains, benefit from enriched home and school environments.

11. Learning is enhanced by challenge and inhibited by threat: Students optimally benefit when their assignments are challenging and the classroom environment feels safe and supportive. Sadioglu & Bilgin (2008) expands upon the importance of eliminating threat from the classroom in the influential Emotional Intelligence.

12- Each brain is unique (Caine and Caine,1999).

It is noticed in the principles that BBL does not refer only to the knowledge and information the learners gain, but it contributes in constructing his character in the light of his experiences, social relations and mental abilities. BBL principles benefited the researcher in designing the stages of the suggested teaching model and the activities presented to second secondary grade learners.

Factors affecting brain based learning

According to Jensen (2005), the following factors affect:

1- Hereditary factor. The learner can reach high level in mental abilities or creativity through the genes that transforms the characteristics which allows the learner to interact in learning or life situations effectively.

2- Environmental factor. Humans are born with ability and readiness to adapt their brains to suit the surrounding environment. They can improve their mental abilities by cooperating and interacting with others.

3- Biological factor. Learners should be able to understand the brain structure and funsction and how to store information and why we forget it.

4- Emotional factor. Emotional experiences with severe reactions influences the work of the brain's focus, attention, memory and thinking. Moderate reactions have some positive effects on the learner.it motivates him to learn and achieve objectives.

5-Kinesthetic factor. body movement is important in the learning process, it helps in secretions of natural aphrodisiacs that increase the energy level of the learner. It also helps in storing and retention of information.

6- Food factor. The brain is influenced with food especially fats. Nutrition system should be based on scientific bases as it improves and activates the brain abilities.

The stages of brain based learning

Assalti (2004) and Marji (2010) indicated that BBL has several stages as follows:

1) Preparation stage

This stage consists of briefing about the topic to let the learner from mind perception on the topic, hence representing the new information and processing and prepare the brain of learner with interrelated topics.

2) Acquisition and direct indirect learning

This stage emphasizes on the importance of forming neural relations directly or indirectly such as: lecture, visual tools, the environmental stimulate and the contests.

3) Elaboration stage

This stage is required by teachers to integrate the learner in the class activities for the deep comprehension and exploring the interrelation among topics through implicit and explicit learning strategies like the brain storming and summarization.

4) Memory formation stage

This stage aims at enhancing the learning where the brain of learner will encode what he/she learned.

There are factors help to retrieve information like good nutrition, the adequate rest and link age to the prior learning.

5) Functional integration stage

This is the last stage of learning in which learning is used foe enhancement and expansion through encouraging learners to questioning about the importance of achieving the goals of learning content, besides clarification the concepts and principles in the content.

Ozden and Glutekin(2008) stated that BBL has the following stages:

1- Orchestrated immersion. In this stage the learner has educational experience that helps him to be involved in practicing thinking skills and make connections to their study and use it to design useful and joyful learning environment.

2- Relaxed alertness. The learning environment is prepared with high level of challenge and low level of threat. The aim is to lessen the stress and fear that hinder the learning process and create a positive learning environment.

3- Active processing. At this stage the learners need to acquire the new data by actively processing it. The teacher should encourage learners to personally internalize new learning.

Conell (2009) stated five stages for BBL.

1- Preparation.

2- Intervention.

3- Elaboration.

4- Memory formation.

5- Constructive integration.

The researcher used the previous stages to build the suggested teaching model in a form that suits secondary stage students and the chosen critical reading skills.

(3)Self-efficacy

Definition

Bandura (2001)- credited with introducing the concept of self-efficacy in the area of social psychology – has defined self-efficacy in his "Guide for Constructing Self-Efficacy Scales" as a conception that one nurtures about his/her own personal 'power' to achieve a given level of performance.

Pintrich &Schunk(1996) defines self-efficacy as an individual's own perception about his/her capacity in performing a job and his/her belief about efficacy in fulfilling a job. According to him, self-efficacy is not a function of individuals' skills; it is their perception of what they can do by using their skills .It is a product about the perceptions about the abilities by using his/her skills, coping with different situations, perception, belief and personal perception about skills, and capacity to manage an activity (Senemoglu,2007).

Klassen(2002) believes that self- efficacy describes the person's expectations about his ability to perform a specific mission and it contributes effectively in involving him to achieve it successfully.

Hsu and Chiu (2004) said that self-efficacy is not skills owned by us but it reflects what people believe about what they can do with the skills they own.

Shah et al (2011) and Almekhlafi (2011) state that self-efficacy is concepts and beliefs of people about their abilities to achieve in different fields.

Efficacy-Activated Processes

Efficacy-Activated Processes include cognitive, motivational, affective and selection processes. A strong sense of efficacy enhances human accomplishment and personal well-being in many ways. People who have high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters intrinsic interest as well as deep engrossment in activities. They set themselves challenging goals and maintain strong commitment to them. They heighten their efforts in the face of failure. They quickly recover their sense of efficacy after failures or setbacks. They attribute failure to insufficient effort or deficient knowledge and skills which are acquirable. They approach threatening situations with assurance that they

can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression (Zimmerman,1995).

In contrast, people who doubt their capabilities shy away from difficult tasks which they view as personal threats. They have low aspirations and weak commitment to the goals they choose to pursue. When faced with difficult tasks, they dwell on their personal deficiencies, on the obstacles they will encounter, and all kinds of adverse outcomes rather than concentrate on how to perform successfully. They slacken their efforts and give up quickly in the face of difficulties. They are slow to recover their sense of efficacy following failure or setbacks. Because they view insufficient performance as deficient aptitude it does not require much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression.

A. Cognitive Processes

The effects of self-efficacy beliefs on cognitive processes take a variety of forms. Much human behavior, being purposive, is regulated by forethought embodying valued goals. Personal goal setting is influenced by self-appraisal of capabilities. The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them.

B. Motivational Processes

Self-beliefs of efficacy play a key role in the self-regulation of motivation. Most human motivation is cognitively generated. People motivate themselves and guide their actions anticipatorily by the exercise of forethought. They form beliefs about what they can do. They anticipate likely outcomes of prospective actions. They set goals for themselves and plan courses of action designed to realize valued futures.

C. Affective Processes

Self-efficacy plays an important role in overcoming the affective problems that a person faces in daily life such as: stress, depression, pressure and other obstacles.

D. Selection Processes

It helps us to choose the appropriate behavior for our abilities; persons avoid activities and situations which they believe above their capacities. They tend to be involved in activities within their limits.

Sources of self-efficacy

People's beliefs about their efficacy can be developed by four main sources of influence. The most effective way of creating a strong sense of efficacy is through mastery experiences. Successes build a strong belief in one's personal efficacy. Failures undermine it, especially if failures occur

before a sense of efficacy is firmly established. If people experience only easy successes they come to expect quick results and are easily discouraged by failure. A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort. Some setbacks and difficulties in human pursuits serve a useful purpose in teaching that success usually requires sustained effort. After people become convinced they have what it takes to succeed, they persevere in the face of adversity and quickly rebound from setbacks. By sticking it out through tough times, they emerge stronger from adversity (Blumenthal, 2014).

The second way of creating and strengthening self-beliefs of efficacy is through the vicarious experiences provided by social models. Seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities master comparable activities to succeed. By the same token, observing others' fail despite high effort lowers observers' judgments of their own efficacy and undermines their efforts. The impact of modeling on perceived self-efficacy is strongly influenced by perceived similarity to the models. The greater the assumed similarity the more persuasive are the models' successes and failures. If people see the models as very different from themselves their perceived self-efficacy is not much influenced by the models' behavior and the results it produces. Modeling influences do more than provide a social standard against which to judge one's own capabilities. People seek proficient models that possess the competencies to which they aspire. Through their behavior and expressed ways of thinking, competent models transmit knowledge and teach observers effective skills and strategies for managing environmental demands. Acquisition of better means raises perceived self-efficacy (Bandura,1998).

Social persuasion is a third way of strengthening people's beliefs that they have what it takes to succeed. People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbor self-doubts and dwell on personal deficiencies when problems arise. To the extent that persuasive boosts in perceived self-efficacy lead people to try hard enough to succeed, they promote development of skills and a sense of personal efficacy. It is more difficult to instill high beliefs of personal efficacy by social persuasion alone than to undermine it. Unrealistic boosts in efficacy are quickly disconfirmed by disappointing results of one's efforts. But people who have been persuaded that they lack capabilities tend to avoid challenging activities that cultivate potentialities and give up quickly in the face of difficulties. By constricting activities and undermining motivation, disbelief in one's capabilities creates its own behavioral validation. Successful efficacy builders do more than convey

positive appraisals. In addition to raising people's beliefs in their capabilities, they structure situations for them in ways that bring success and avoid placing people in situations prematurely where they are likely to fail often (Bandura,2001).

The fourth way of modifying self-beliefs of efficacy is to reduce people's stress reactions and alter their negative emotional proclivities and misinterpretations of their physical states. It is not the sheer intensity of emotional and physical reactions that is important but rather how they are perceived and interpreted (Mills, 2008). According to self –efficacy theorists Bandura (1998), people develop their self- perceptions of efficacy from four major sources of experiences.

Mastery experience: Known also as "performance accomplishments".Bardakci(2010) and Brown (2012) refer to the way people assess their own personal attainment in a given arena. Following this line of thought, students who judge their own past academic results as being successful often develop a high sense of confidence about their abilities while those who view their academic outcomes as unsuccessful are likely to experience feelings of doubts and uncertainty about their own effectiveness.

Vicarious experience (observational): It relates to the self-evaluation that individuals derive from observing and comparing themselves with a given social model. When students observe a given model- that they view as compatible with them- in terms of traits and skills – succeed at handling a certain situation or solving a given task, they are likely to feel able to meet a similar challenge.

Verbal persuasions: The conceptions that people develop about their capacities in a given field are likely to be influenced by the verbal and 'tacit' output they receive from others. Note, yet, that verbal and non-verbal messages (like a facial expression, for instance) become particularly influential when they are emitted by persons that are regarded as "credible persuaders" in their own environment such as parents, teachers and experts.

Physiological states: self-efficacy estimates might also be affected by "somatic and emotional states" (Bandura, 2001). Yet, it is not always the negative emotions such as: stress, anxiety, fear per se that negatively affect performance but it is rather the faulty interpretations that students make about the purported causes of those psychological states. For example, students might develop a low opinion about their competence in a given field when they judge (wrongly) the 'normal' states of tension that usually accompany certain important academic events (such as exams) as an indicant of incompetence and inefficiency.

Method

To answer the study questions, the following procedures were followed:

1-Identifying the required critical reading skills for the second grade secondary school students

The required critical reading skills for the second grade secondary students as determined by the jury members of the current study are: identifying the main idea, making inferences, differentiating facts from opinions, comparing and constructing and summarization. Thus the first sub-question of the study was answered.

2- Identifying the theoretical foundation and features of the brain-based teaching model.

a-The researcher prepared the suggested brain-based teaching model in the light of the following:

1- The objectives of teaching English for the secondary stage.

2- The concept of brain-based learning and the factors affecting it.

3- The stages of brain-based learning.

4- The characteristics of brain-based learning.

b- Constructing the suggested brain-based teaching model which consisted of five stages:

1- Preparation

This stage presents a framework for the new learning. It prepares the learner's brain with all possible connections. This stage includes general idea about the topic and mental imagination for related topics. The more the learner has background about the topic, the faster he will be in acquiring and processing the new data.

This stage requires the teacher to:

- Prepare the learners' brains for the new topic by recognizing the connections between previous experience and the new topic.

- Provide suitable and threat less classroom climate for learners, the class should present fearless educational environment.

- Establish the class environment with suitable enriching experiences to enable the learner to absorb the new mental connections, thus making the new inputs reliable to reach deep thinking.

- Place the learners in real environment closely related to the target issue.

2- Acquisition

Acquisition is a mental process to organize experiences and knowledge to make it suitable for the learner's experiences; to form connections or to continue with some neuroses. This can be achieved through environmental stimuli such as role play and group work.

This stage requires the teacher to:

- Activate the brain to recall the neural networks and helping the learner to construct new mental connections.

- Strengthen the mental relations connected to the experience subject.
- Construct rich previous experiences before starting new learning experiences.
- Establish stimulating environment for cooperation, interaction and positive competition from learners.

3-Elaboration

This stage supports the depth of understanding and untangling the resulting from the new learning. This can be achieved through involving the learner in different activities and reaching neural balance state which is reflected in acceptance of information and clarity of experience meaning.

This stage requires the teacher to:
- Design expansion situations in interactive experiences which are mentally and neutrally related.
- Encourage learners to apply the target learning in real and new situations.
- Supply feedback by using role-play, trips or life experiences.

4- Integration

This stage aims to construct neural network directed to the identified learning objective and when the learner is aware of his objective, he becomes neutrally alert.

This stage requires the teacher to:
- Organize experiences in webs or mental maps that suits the neural networks to learn.
- Supply the learner with instant and continuous feedback and clarifying the objective of the learning.
- Supply relieving atmosphere and suitable neural stir.
- Involve the learner in positive emotions.
- Present exciting and active experiences to meet the learners' needs to form memory.

5- Evaluation

The previous four stages should include evaluation aiming at giving interactive feedback about the learners' performance to adapt themselves. Feedback takes place when the learner makes a mistake in response to stimuli; the brain revises the stimuli before responding. It also re- process the data again.

This stage requires the teacher to:
 - Give instant and continuous feedback to learners' performance.
- Give the learner the opportunity to take decisions.
 The teacher's role can be summed in:

- Preparing the cooperative work to acquire social interaction methods and to supply fertile and fearless learning environment.
- Using comforting and joyful techniques to keep fear and stress from learners like role playing and games.
- Encouraging the learners to generate ideas and solutions freely and spontaneously as much as they can.
- Giving learners the chance to talk, discuss and brain storm to discover the outer environment.

The learner's role

The learner participates with his colleagues in the presented activities and they direct their mental abilities themselves. They have the ability to use physical dimensions to develop cognitive abilities .They interact with the outer educational institutions to develop their brains whenever possible.

The students' assessment

The assessment was divided into three stages:

-Pre-assessment which occurred at the beginning of every lesson to arouse the trainees' interest and to direct their attention. It also helped in identifying any prior information they knew about the topic of the training.

-Formative assessment during the lesson to follow the learners' cooperation in answering the worksheets.

-Final assessment at the end of every lesson to make sure that the learners gained the target skills by asking questions and having discussions with them.

Judging the suggested teaching model

The primitive model, the list of basics of brain-based learning and two critical reading passages presented according to the stages of the suggested model were given to a jury who suggested some modifications in the teacher's role. The jury agreed on the appropriateness of the model stages to brain-based learning philosophy and aim. They also approved its logical sequence. (The jury who kindly validate the suggested BBL model and the tools of the study were three staff members from the Department of Curricula and Methods of Teaching, Girls' College, Ain Shams University and three staff members from other faculties.)

c- Preparing the content presented through the teaching model.

Second secondary grade student's book consists of nine units for the first term, each unit has a reading passage followed by different critical thinking questions. The reading passages were presented using the suggested brain-based teaching -model. The passages have the following titles:

- Unit 1: Professor Magdi Yacoub
-Unit 2: Guliver's voyage to Lilliput

-Unit 3: The growth of online shopping
-Unit 4: Cooperation
-Unit 5: Lord of the flies
-Unit 6: Why do they do it
-Unit 7: We are living in a global economy
-Unit 8: The necklace
- Unit 9:The Olympic Games

The presentation of the reading passages using the suggested teaching model lasted for 10 sessions (10 weeks), a session every week. Every session lasted for 90 minutes (two sequenced school periods). The first session was an introductory one; the researcher acquainted the learners with the fundamental information about brain-based learning, defined and explained the targeted critical reading skills and also the stages of the suggested model. The researcher also clarified what the learners are expected to do. The meaning and importance of self-efficacy in learning was presented in the introductory session. The rest of the sessions were devoted to presenting the 9 reading passages in the student's book.

The researcher faced objections and resistance from the learners at first as they thought they will take extra information. Once the sessions started and they were involved in the activities in friendly atmosphere, they cooperated and enjoyed the rest of the sessions.

d- Preparing the teacher's guide and the activity papers.

To prepare the teacher's guide, the following was done:

Identifying the objectives of the guide: it aimed at guiding and facilitating the teaching steps for the English teachers. The guide will help them to achieve the target objectives and to develop the second secondary grade learners' critical reading and self-efficacy.

Identifying the content of the teacher's guide: the guide started with an introduction which included the purpose of the guide, definition of brain-based learning, the stages of the suggested teaching model in the light of brain-based learning and general directions to teach the presented material. The guide also explained the teacher and the learner's role at every stage of the suggested model. The guide also included a scheme for every lesson according to the steps of the suggested teaching model containing (the title- objectives- stages and procedures). Every lesson included the learners' activity papers.

Judging the primitive version of the teacher's guide: it was given to the jury after clarifying its aim and they were kindly asked to validate the appropriateness of the teaching procedures with the stages of the suggested model, the suitability and adequacy of the activities. They

suggested some modifications which were taken in consideration in the final version of the teacher's guide.

Thus, the second sub-question of the current study was answered.

Constructing the study tools

Tools of the Study

Treatment materials:

1- Critical reading checklist.

2- A teacher's guide to present critical reading skills using the brain-based learning suggested model.

3- Activity papers for students to develop critical reading skills in the light of the suggested teaching model.

Measurement tools:

1- A pre-post critical reading test.

2- A pre-post self-efficacy questionnaire.

The study tools were constructed in light of the following procedures:

1. Reviewing previous studies concerned with self-efficacy and language tests, especially those that are concerned with the topic of how to develop critical reading skills and self-efficacy.

2. Identifying the critical reading skills and self-efficacy dimensions to be measured in the final version of the critical reading skills test and the self-efficacy questionnaire.

3. Examining the student's book content to identify the learning objectives to be measured.

4. Reviewing the Ministry of Education Directives concerning the aims of teaching English as a foreign language for the secondary stage.

The researcher designed the study tools as following:

A- Critical reading test

The researcher developed a critical reading skills test. The test was used as a pre-post instrument to assess the critical reading skills of students before and after the experiment.

The test aim: It aimed at pre-post measuring the critical reading skills of the members of both the experimental and control groups of the current study.

Constructing the test: two reading comprehension passages were selected for the pre-posttest. Each passage was followed by 15 different questions. Each critical reading skill had three different questions to measure in every passage with the total of 6 items in the two passages. The reading passages were analyzed for the purpose of developing critical questions that measure second secondary grade students' performance in the target critical reading skills.

 The test validity: To measure the test content validity, the first version of the test was submitted to jury members to evaluate the test in terms of (a)

number of questions and appropriateness to the chosen skills, (b) suitability of the test to the second secondary graders, and (c) suitability of the test to measure the intended skills. The jury members' suggestions were taken seriously into consideration and modifications were done accordingly. After the modifications were made, the test was mostly a valid one, as it showed that it measured what it was intended to measure as stated by the jury. Some of the most prominent modifications suggested by the panel jury were as follows:

-Measuring the feasibility of the test in a pilot study to know whether the students will be able to answer the questions of the test.

-Modifying some of the distractors of the multiple-choice questions.

Reliability of the test: The test retest method was used to determine the reliability of the test. The test was administered to 15 students who were not included in the experiment of the current study and was re administered by an interval of fifteen days to the same group. Then, the Pearson Correlation Coefficient between the test/re-test was calculated. The reliability coefficient was 0.91 which is relatively high .So, the test was reliable.

Timing the test: During the piloting administration of the test on the same 15 students, the time taken by all the students divided by the number of the students, $\dfrac{summation\ of\ the\ time\ taken\ by\ all\ the\ students}{the\ number\ of\ the\ students}$ = 900/15=60 minutes

Scoring the test: The students' answers on the pre-posttest were scored by the researcher. When scoring the test, one point was given for each correct response while zero was given for wrong or left answers. The total number of questions in the test was 30 and therefore the whole test was scored out of 30.

B- Self- efficacy questionnaire

Aim of the questionnaire: the questionnaire aimed at identifying the level of the second grade secondary students' self-efficacy before and after the experiment.

Constructing the questionnaire: after reviewing self-efficacy literature, previous related studies and the mental and psychological characteristics of secondary stage students, the researcher designed it. It had four basic dimensions in the form of statements said by the students to report their self-efficacy as follows:

-Self-awareness, and it included 8 statements (1-8).

-Perseverance in learning, and it included 10 statements (8-18).

-Tendency to critical reading and it included 10 statements (18-28).

-Interaction and achievement, and it included 12 statements (28-40).

The questionnaire started with simple introduction for the learners about the purpose of the questionnaire and the meaning of self-efficacy. It also included some instructions.

The design and correction of the questionnaire: The total number of statements was 40.Every statement had four responses (always true, sometimes true, rarely true, not true).In scoring the questionnaire the positive statement was given the marks (4-3-2-1) and the negative one is given the marks(1-2-3-4).The total mark of the questionnaire was 160 marks .

The questionnaire validity: it was given to the jury members to give their opinion about the appropriateness of the statements for their purpose and the learners' characteristics. They suggested that some words should be replaced by simpler ones to suit second secondary students' level. They agreed on the suitability and validity of the scale to its aim.

Pilot application of the questionnaire: The questionnaire was applied in its final form on a group of 31 2nd year secondary students in Bin al Sariat secondary school twice to achieve reliability. Holsti formula was used and the agreement was 0.80 which is an accepted rate. The average time taken to finish the scale was 35 minutes as the statements were clear for the students.

Participants

The current study had two groups; experimental group and control group with 40 second- year secondary students in each group during the first term of the academic year 2015/2016.Two classes were chosen randomly from AL Abbassia secondary school for girls, students of the first class were chosen as experimental group while students of the other class were chosen to be members of the control group after being sure that they were equivalent in critical reading skills and self-efficacy.

Data Analysis

The data obtained from pre and post applications of the tools of the study on the experimental and control groups were analyzed by using statistical package for social science (SPSS).

The first hypothesis

There will be a statistically significant difference between the mean scores of the experimental and control groups on the post administration of the critical reading skills test in favor of the experimental group.

After the post administration of the critical reading test on both the experimental and control groups, t-test for independent sample was used to compare the results as follows:

Table (1) t-test results of the post administration of the critical reading skills test on the experimental and control groups

Group	N	M	S.D	Difference between means	Degree of freedom	t-value	Significance level
Experimental	40	29.38	2.29	17.48	78	22.89	0.01 Significance
Control	40	11.90	4.25				

Table (1) shows that the mean scores of the experimental group in the post administration of the critical reading skills test (29.38) is more than the mean scores of the control group (11.90). The difference is about (17.48) marks in favor of the experimental group. The above table shows that the estimated t-value (22.89) is statistically significance at 0.01 level. Thus it can be safely said that there are statistically significant difference between the mean scores of the critical reading skills of the experimental and control group in favor of the experimental group. This shows that the members of the experimental group developed their critical reading skills more than those of the control group due to the positive impact of the brain-based teaching model.

The second hypothesis

There will be a statistically significant difference between the mean scores of the critical reading skills of the experimental group on the pre and post administration of the test in favor of the post administration.

After the pre-post administration of the critical reading test on the experimental group, t-test for paired sample was used to compare the results as follows:

Table (2) t-test results of the pre-post administration of the critical reading skills test on the experimental group

Application	N	M	S.D	Difference between means	Degree of freedom	t-value	Significance level
post-test	40	29.38	2.29	17.22	39	35.61	00.1 significance
pre-test	40	12.15	4.19				

Table (2) shows that the mean scores of the experimental group in the post administration of the critical reading skills test (29.38) is more than the mean scores of the pre administration of the test (12.15). The difference is about (17.22) marks in favor of the post-test.

The above table shows that the estimated t-value (35.61) is statistically significance at 0.01level. Thus it can be safely said that there is a statistically significant difference between the mean scores in the pre and post administration of the critical reading skills test on the experimental group in favor of the post administration. This shows that the members of the experimental group developed their critical reading skills after the application of the suggested brain-based teaching model due to the positive impact of the brain-based teaching model.

The third hypothesis

There will be statistically significant differences between the mean scores on the post administration of the test on each critical reading sub-skill: identifying the main idea, differentiating between fact and opinion, making inferences, comparing and contrasting and summarization for the experimental and control group in favor of the experimental.

After the post administration of the critical reading test on both the experimental and control groups, t-test for independent sample was used to compare the results concerning critical reading sub-skills as follows:

Table (3) t-test results of the post administration of the critical reading skills test for the experimental and control groups (sub-skills)

The skill	The group	N	M	S.D	Difference between means	Degree of freedom	t-value	Significance level 0.01
Identifying the main idea	Experimental	40	5.49	1.35	3.3	78	14.5	Sig.
	Control	40	2.19	2.34				
Making inferences	Experimental	40	5.25	1.47	3.15	78	13.1	Sig.
	Control	40	2.1	1.56				
Differentiating facts from opinions	Experimental	40	5.34	1.44	3	78	12.5	Sig.
	Control	40	2.34	1.74				
Comparing and	Experimental	40	5.85	0.66	3.3	78	14.5	Sig.

constructing	Control	40	2.55	2.67				
	Experimental	40	5.25	1.47	3.15	78	13.1	Sig.
Summarization	Control	4	2.1	1.56				

Table (3) shows that the mean score of the experimental group surpass the mean score of the control group in each critical reading sub-skill in the post administration of the test as follows:

1- The mean score for the experimental group in identifying the main idea is (5.49), while the mean score for the control group is (2.19). The difference is (3.3) in favor of the experimental group. t-value is (14.5) which is statistically significant at 0.01 level.

2- The mean score for the experimental group in making inferences is (5.25), while the mean score for the control group is (2.1). The difference is (3.15) in favor of the experimental group. t-value is (13.1) which is statistically significant at 0.01 level.

3- The mean score for the experimental group in differentiating facts from opinions is (5.34), while the mean score for the control group is (2.34). The difference is (3) in favor of the experimental group. t-value is (12.5) which is statistically significant at 0.01 level.

4- The mean score for the experimental group in word reference is (5.85), while the mean score for the control group is (2.55). The difference is (3.3) in favor of the experimental group. t-value is (14.5) which is statistically significant at 0.01 level.

5- The mean score for the experimental group in summarizing is (5.25), while the mean score for the control group is (2.1). The difference is (3.15) in favor of the experimental group. t-value is (13.1) which is statistically significant at 0.01 level.

Thus it can be safely said that there are statistically significant differences between the experimental and control groups mean scores on the post administration of the test on each critical reading sub-skill: identifying the main idea, differentiating between fact and opinion, making inferences, comparing and contrasting and summarization in favor of the experimental group. Thus assures the positive impact of the brain-based teaching model on developing the experimental group students' critical reading skills.

The fourth hypothesis

There will be statistically significant differences between mean scores of the experimental group students on the pre and post administration of the test on each critical reading sub-skill: identifying the main idea, differentiating between fact and opinion, making inferences, comparing and contrasting and summarization in favor of the post administration.

After the pre and post administration of the critical reading test on the experimental group, t-test for paired sample was used to compare the results concerning critical reading sub-skills as follows:

Table (4) t-test results of the pre-post administration of critical reading skills test on the experimental group (sub-skills) and the effect size of the suggested model on each of them

The skill	The application	N	M	S.D	Difference between means	Degree of freedom	t-value	Significance level 0.01	Effect size
Identifying the main idea	Posttest	40	5.49	1.35	3	39	12.5	Sig.	1.35 large
	Pretest	40	2.49	2.04					
Making inferences	Posttest	40	5.25	1.47	2.85	39	8.41	Sig.	1.27 large
	Pretest	40	2.4	1.63					
differentiating between fact and opinion	Posttest	40	5.34	1.44	3	39	12.4	Sig.	1.32 large
	Pretest	40	2.34	2.4					
Comparing and contrasting	Posttest	40	5.85	1.32	3.21	39	9.8	Sig.	1.49 Large
	Pretest	40	2.64	1.38					
summarizing	Posttest	40	5.34	1.44	2.7	39	7.03	Sig.	1.25 Large
	Pretest	0	2.64	2.07					

Table (4) shows that the mean scores of the experimental group in the post administration of the test surpass its mean score in the pre administration of the test in each critical reading sub-skill. Besides the effect size of the suggested model on each sub skill was estimated through the effect size formula of Murad (2000,97)as follows:

1- The mean score for the post administration of the test in identifying the main idea is (5.49), while the mean score for the pre administration of the test is (2.49). The difference is (3) in favor of the post administration of the test. t value is (12.5).The size effect is large (1.35) as the accepted large effect size is 0.8.

2- The mean score for the post administration of the test in making inferences is (5.25), while the mean score for the pre administration of the test is (2.4). The difference is (2.85) in favor of the post administration. t Value is (8.41). The size effect is large (1.27) as the accepted large effect size is 0.8.

3- The mean score for the post administration of the test in differentiating facts from opinions is (5.34), while the mean score for the pre administration of the test is (2.34). The difference is (3) in favor of the post administration. t value is(12.4). The size effect is large (1.32) as the accepted large effect size is 0.8.

4- The mean score for the post administration of the test in comparing and contrasting is (5.85), while the mean score for the pre administration of the test is (2.64). The difference is (3.21) in favor of the post administration. t value is (9.8). The size effect is large (1.49) as the accepted large effect size is 0.8.

5- The mean score for the post administration of the test in summarizing is (5.34), while the mean score for the pre administration of the test is (2.64). The difference is (2.7) in favor of the post administration. t value is (7.03). The size effect is large (1.25) as the accepted large effect size is 0.8.

Thus the fourth hypothesis of the study was verified and the third sub question of the study was answered.

The fifth hypothesis

There will be a statistically significant difference between the mean scores of the experimental and control groups in the post application of self-efficacy questionnaire in favor of the experimental group.

After the post application of the self-efficacy questionnaire on both the experimental and control groups, t-test for independent sample was used to compare the results as follows:

Table (5) t-test results of the post application of self-efficacy questionnaire on the experimental and control groups

The group	N	M	S.D	Difference between means	Degree of freedom	t-value	Significance level 0.01
experimental	40	144.42	10.71	56.25	78	19.998	Sig.
Control	40	79.4	17.56				

Table (5) shows that the mean score of the experimental group in the post application of the self-efficacy questionnaire is (144.42) which is more than the mean score of the control group (79.4). The difference is about (56.25) marks in favor of the experimental group.

The above table shows that the estimated t-value (19.998) is statistically significance at 0.01level. Thus it can be safely said that there is a statistically significant difference between the mean scores of the experimental and control groups in the post application of self-efficacy questionnaire in favor of the experimental group. This shows that the members of the experimental group developed their self-efficacy after the application of the suggested brain-based teaching model due to the positive impact of the brain-based teaching model.

The sixth hypothesis

There will be a statistically significant difference between the mean scores of the experimental group in the in the pre and post applications of the self-efficacy questionnaire in favor of the post application.

After the pre- post applications of the self-efficacy questionnaire on the experimental group, t-test for paired sample was used to compare the results as follows:

Table (6) t-test results of the pre-post applications of self-efficacy questionnaire on the experimental group and the effect size of the suggested model on students' self-efficacy.

The application	N	M	S.D	Difference between means	Degree of freedom	t-value	Significance level	Size effect
Post	40	144.42	10.71	69.55	39	47.81	0.01	1.25 large
Pre	4o	74.88	12.59					

Table (6) shows that the mean score of the experimental group in the post application of the self-efficacy questionnaire is (144.42) which is more than the mean score of the pre application (74.88). The difference is about (69.55) marks in favor of the post application.

The above table shows that the estimated t-value (47.81) is statistically significance at 0.01 level. Besides the size effect of the suggested model is large (1.25). Thus it can be safely said that there is a statistically significant difference between the mean scores in the pre- post application of the self-efficacy questionnaire on the experimental group in favor of the post application. This shows that the members of the experimental group developed their self-efficacy after the application of

the suggested brain-based teaching model. This assures the positive impact of the brain-based teaching model on the experimental group students. So the sixth hypothesis of the study was verified and the fourth sub question of the study was answered. Thus the main question of the study was also answered and the aims of the study were achieved.

Discussion of Results

The results of the research assured the large effect of the suggested brain-based teaching model on developing second secondary grade students both critical reading skills and self-efficacy.

Firstly, the results of the critical reading test.

- The results of the current research confirmed the results of similar studies which used BBL to develop learners' achievement as well as language skills such as Duman(2010) who showed the positive effect of brain-based learning on academic achievement of students with different learning styles, Ozden (2008) assured the positive influence of brain-based learning on achievement and retention of knowledge in science course and Kaur (2013) examined the effect of brain-based learning strategies on enhancing achievement and life skills among primary school pupils.

- The introductory session helped the students to know much about BBL learning and its advantages in enhancing learning. They also knew the stages of the suggested teaching model and what they were expected to do. The introductory session also introduced critical reading and its sub skills to them .So, they focused much on developing them.

-The stages of the suggested teaching model included different activities in different shapes such as group work, role playing and games which helped in creating friendly and enthusiastic atmosphere.

-The suggested teaching model helped in relating the students' prior experiences to new ones and created integration between them.

-The suggested teaching model included different effective teaching strategies such as brainstorming and cooperative learning.

- The students' positive participated in all the model's stages helped in increasing their self-efficacy.

- Learning resources were varied; visual and audio. The researcher presented also used materials from the internet which helped in activating the brain.

- The researcher used some several techniques to provoke the learners' brains to be alert and in full energy during the sessions: working in pairs or groups to share ideas, direct and correct each other.

-Giving the learners two breaks during the session restored their brains' energy to resume learning actively.

-Using appropriate signs and facial expressions during the verbal explanation helped to arouse the learners' unconscious feelings to be focused on the learning objective.

Secondly, the results of the self-efficacy questionnaire.

-Presenting appropriate critical reading skills for the learners' abilities helped them in mastering them. When reading experience developed their confidence in their ability to read increased. Their brains were neurotically directed to achieve their objectives

-Stressing the importance of the learners' positive participation in all the suggested model stages, helped in constructing beliefs and impressions about their ability to read and even to contribute successfully in accomplishing the learning process.

- Presenting variable activities and guiding the learners to notice their improvement during the sessions, helped in developing their self-efficacy. They noticed their progress and self-confidence while reading. Besides they were continuously encouraged to participate and to learn from their mistakes.

-The learners had the opportunity to express themselves and their ideas freely. They were encouraged to feel positive about their abilities to read and to improve as the sessions had friendly atmosphere.

-Using different teaching strategies helped in supporting their brains' activity including storing and recalling critical reading skills in the long term memory. They could also recall it easily. All this helped in forming positive attitude toward their abilities and themselves.

- The researcher supplied learners with quick feedback during their work in groups and at the end of every activity to make them aware of their weakness and strength points so they became more persistent in improving themselves and correcting their mistakes. They had more self-confidence which led to increased self-efficacy.

Recommendations

In the light of the results of this study, the following recommendations are made:

-Directing English teachers' attention to present critical reading skills to learners in a functional and appealing way rather than neglecting them. Teachers need to know critical reading subskills. So the critical reading skills checklist presented in this study should be presented to them.

-English teachers should value the importance of self-efficacy in their students' achievement and acquisition of language skills, especially critical reading. Students achieve better when they have self-confidence and learn in joyful and threat less atmosphere.

-English program designers should include brain-based learning principles in the teaching process. It is necessary to organize the syllabus and content of the textbook accordingly.

-Training in-service English teachers on brain-based theory and its applications in education. It is necessary to conduct workshops for teachers for this purpose.

- Supplying methods of teaching English courses in the faculties of education with brain-based learning theory and its application.

-Re-considering the topics of some critical reading passages presented to secondary students to arouse their interest and challenge their brains. The way teachers handle critical reading passages also should be reviewed

- Applying different brain-based models in teaching English as they were effective in developing achievement.

Suggestions for Further research

The current study presents the following suggestions:

- Examining the effectiveness of brain-based learning on developing other skills rather than critical reading skills such as critical writing.

-Investigating using brain-based learning principles in preparing English section student teachers.

-Studying the influence of developing critical reading skills on other language areas like grammar and vocabulary.

-Measuring the effectiveness of training English in-service teachers on using brain-based learning to develop students' language skills.

-Investigating the influence of learners' self-efficacy on learners' language acquisition.

References

Abdelmoaty, R. A. (2002). The effectiveness of using first year secondary students'   questions in developing their critical reading skills in light of schema theory.   Unpublished M. A. Thesis. Women's College, Ain Shams University.

Abdel-Moghni,S. (2011). The Effectiveness of Self-questioning Strategy in Developing the Critical Reading Skills among First Year Secondary Stage Students. Unpublished master dissertation, Faculty of Education, Minoufiya University.

Abdullah,k.(1998). Title Critical reading skills: Some notes for teachers. Published by National Institute of Education (Singapore)

Abouhadid, I. A. F. (2003). Using free reading in public libraries for developing reading comprehension for intermediate experimental language school student, case study. Unpublished master Thesis. Ain Shams University.

Acikel,M. (2011). Language learning strategies and self-efficacy beliefs as predictors of English proficiency in a language preparatory school, Master degree, Middle East Technical University.

Akyurek,E. , Afacan, O.,(2013). Effects of Brain-Based Learning Approach on Students' Motivation and Attitudes Levels in Science Class. Mevlana International Journal of Education (MIJE) Vol. 3(1), pp. 104-119, 1 April, 2013 Available online at http://mije.mevlana.edu.tr/.

Alfilimbani, D. (2014). The impact of brain based learning training program and level of mastering on the development of skills of para learning and academic achievement in Saudi Arabia (Unpublished doctoral dissertation). Cairo University.

AL-Mekhlafi,M.A.(2011).The relationship between writing self-efficacy beliefs and final examination scores in writing course among a group of Arab EFL trainee-teachers, international journal for research in education, no 29, Sana university, Yemen.

Altiti, M. (2014). The impact of a brain-based teaching program on imporing the achievement of 5th grade students in sciences. Journal of Islamic university, 22(1), 111-138.

Amer, W. S. T. (2009). The effect of using jigsaw II method on developing preparatory one students' reading skills in English. Unpublished Master Thesis. El Menoufeya University.

Armstrong, T. (2009). Multiple Intelligences in the Classroom. 3rd ed. Alexandria, Va.: Association for Supervision and Curriculum Development.

Assalti, N. (2004). Brain-based learning. Association for Supervision and Curriculum Development (1st ed.). Amman, Jordan.

Bandura, A. (2001). Guide for constructing self-efficacy scales. Retrieved April 15,2002, from http://www.emory.edu /EDUCATION/mfp/guide.

Bandura,A.(1998):Health promotion from the perspective of social cognitive theory. Psychology and health, 13,623-649.

Bardakci, M. (2010). The effect of awareness raising about judgment errors on the improvement of critical reading, (Unpublished doctoral thesis). Gazi University, Ankara.

Basaraba D. et al., (2013). Examining the structure of reading comprehension: Do literal, inferential, and evaluative comprehension truly exist? Reading and Writing, An Interdisciplinary Journal, Volume 26, Issue 3, March 2013, pp. 349-379.

Blumenthal,L.F.(2014). Self-efficacy in low level language learners, master, Portland University.

Brassell,D. & Rasinski,T. (2008). Comprehension that works. Taking students beyond ordinary understanding to deep comprehension. California: Shell Education.

Brodnax, R. M. (2004). Brain compatible teaching for learning. (Unpublished PhD Thesis), Indiana University, Indiana.

Brown, B. (2012). Bringing brain research into teaching. Principal, 34-35.

Caine, G., Caine, R.N., McClintic, C. & Klimek, K. (2005). 12 Brain/Mind learning principles in action. Thousand Oaks, CA: Corwin Press.

Caine, R. N., & Caine, G. (1994). Making connections: Teaching and the human brain. New York: Addison-Wesley.

Caine, R., & N. Caine. (2006). Meaningful learning and the executive functions of the brain. The Neuroscience of Adult Learning, 53-62.

Caine, R., G. Caine, and S. Crowell. (1999). Mind shifts: A Brain-Compatible Process for Professional Development and the Renewal of Education. Tucson, Ariz.: Zephyr Press.

Caine, R., G. Caine, C. McClintic, and K. Klimek.(2009). 12 Brain/Mind Learning Principles in Action: Developing Executive Functions of the Human Brain. Thousands Oaks, Calif.: Corwin Press.

Conell.J.D. (2009). The global aspects of brain-based learning. Educational horizons, 23-39.

Cooper,J. Wranck,E. & Shipman,D. (1988). The what and how of reading instruction. London: Ball University Press.

Duman, B.(2010).The effects of brain-based learning on academic achievement of students with different learning styles, educational science: theory and practice, vol 110, no4.

Duman, B.(2010).The Effects of Brain-Based Learning on the Academic Achievement of Students with Different Learning Styles .Muğla

University, Faculty of Education, Department of Educational Sciences, Turkey.

El-Didi, N. A.(2001). A proposal model for developing metacognitive problem-solving reading strategies of secondary stage EFL teachers and students. Unpublished Ph.D. Dissertation. Faculty of Education, Ain Shams University.

Erlauer, L. (2003). The brain-compatible classroom: Using what we know about learning toimprove teaching. VA: ASCD, Alexandria.

Gardner, H. (1983). Frames of Mind: The Theory of Multiple Intelligences. New York, N.Y.: Basic Books.

Greta,G.(2009).Investigating second language learner self-efficacy and future expectancy of second language use for high-stakes program evaluation, foreign language Annals, v42 n3 p505-540.

Hellyer, R., Robinson, C., & Sherwood, P. (2002). Study Skills for Learning Power, 2nd ed.

Hong,S. (2000). Improving students' ability to problem solve through social skills instruction. ERIC Database (Ed 447907).

Houzel S. (2009). The human brain in numbers: a linearly scaled-up primate brain. Front. 4th ed.Sinauer Associates. pp. 432–4.

Hsu.M-H and Chiu.C-M (2004).Internet self- efficacy and electronic service acceptance, Decision supports system, 38,p369-381.

Ibrahem, S. A. M. (2007). A Training program in learning metacognitive strategies in English to improve reading comprehension for low-achievers in preparatory schools. Unpublished M.A. Thesis. Ain Shams University.

Jennifer,E.(2007).The reading and writing self- efficacy beliefs of students with discrepant reading and writing performance, PHD, New York, MSED, Fordham University.

Jensen, E. (1998). Teaching with the brain in mind. Virginia, ASCD Publication.

Jensen, E. (2005). Teaching with the brain in mind. USA: The Association for Supervision and Curriculum Development.

Jensen, E. (2005).Teaching with the brain in mind. Alexandria, VA: ASCD.

Jensen, E. 1995/2000 (revised). Brain-based Learning: The New Science of Teaching and Training. Rev. ed. Thousand Oaks, Calif.: Corwin Press.

Jensen, E. P. (2008). Brain-based learning: The new paradigm of teaching (2th ed). San Diego, CA: Corwin Press.

Kaur, J. (2013). Effectiveness of Brain Based Learning Strategies on Enhancement of Life Skills among Primary School Students with internal and external Locus of Control, International Journal of Advancements in Reasearch &Technology, Vol. (2), No. (6), pp. (128-143).

Khttab, A. (2013). The impact of using brain-based learning theory in mathematics teaching. On developing the skills of mathematical communication and mental arithmetic by the students of primary (basic) stage (unpublished master's thesis). Alfayoom university.

Kiedinger, R. (2011). Brain-based learning and its effects on reading outcome in elementary aged students, Master degree, University of Wisconsin-south.

Klassen R.(2002): writing in early adolescence : a review of the role of self-efficacy beliefs, Educational Psychology Review, Vol 4, No 2, June.

Knott, D. (2010). Critical reading towards critical writing. Retrieved February 17, 2011, from http://www.writing.utoronto.ca/advice/ reading-and-esearching/critical-reading.

Lepper, L. (2011). Whole brain teaching techniques. ajarn, Retrieved on November 6, 2011, from http://www.ajarn.com/ajarn-guests/articles/whole-brain-teaching-techniques/

Ozden, M. & Gultekin,M., (2008). The Effect of Brain-based learning on Academic Achievement and Rentention of Knowledge in Science Course", Electronic Journal of Science Education, Vol..(12), No. (1), pp.(3-17).

Partnership for reading (2005). Retrieved December 21, 2010, from http.//nifl.gov/ partnership for reading/

Pedersen, J. (2011). Whole brain teaching and Victor Elementary School District. Whole Brain Teaching. Retrieved November 6, 2011, from ttp://powerteachers.net/goodies/research.html.

Pintrich, P. & Schunk, D. (1996). The role of expectancy and self-efficacy beliefs. Newtonian physics among form four Student. International Journal of Environmental & Science Education, 7(1).

Raofi,S. et al (2012). Self-efficacy in second/foreign language learning contexts, English Language Teaching; Canadian Center of Science and Technology, vol.5,no.11.

Roe,B. et al. (1995). Secondary school reading instruction. The content area (5th Ed.). Houghton Mifflin Company.

Sadioglu, O., & Bilgin, A. (2008). The relationship between critical reading skills of elementary school students and their gender and the educational level of their parents. Elementary Education Online, 7(3), 814-822.

Saleh, S. (2011):The effectiveness of Brain-Based Teaching Approach in dealing with problems of Form Four students' conceptual understanding Newtonian physics", Asia Pacific Journal of Educators and Education,Vol. (26), No. (1), pp. (91-106).

Senemoglu, N. (2007). Learning improvement and teaching. Ankara: Gönül Publication.

Shah.P.M et al (2011).Self-efficacy in the writing of Malaysian ESL learners, World Applied Science Journal, Vol 15,ISSN 18184952,P.P8-11.

Slavkin, M. (2004). Authentic learning: How learning about the brain can shape the development of students. Lanham, MD: Scarecrow Education.

Sousa, D. A. (2001). How the brain learns: A classroom teacher's guide. California, Corwin Press,Inc.

Sousa, D.(2006). How the Brain Learns. 3rd ed. Thousand Oaks, Calif.: Corwin Press. Sprenger, M. B.

Sprenger, M. (2002). Learning & memory: Brain in action. ASCD, Alexandra.

Tileston, D. (2005). 10 best teaching practices: How brain research, learning styles and standards define teaching competencies (2th ed). Thousand Oaks, California: Corwin Press.

Tilfarliolu.F. and Cinkara.E.(2009). Self-efficacy in EFL:Differences among proficiency groups and relationship with success,Novitas Royal,research on youth and language, vol3, no 2,129-142.

Tomasek,T. (2009). Critical reading: Using reading prompts to promote active engagement with text. International Journal of Teaching and Learning in Higher Education, 21 (1), 127-132.

Ur-Rehman, A. (2011). Effectiveness of Brain Based Learning Method and Conventional Method in the Teaching of Mathematics at Secondary Level in Pakistan", Degree of Doctor, Faculty of Social Sciences, International, Islamic University, Islamabad.

Wagmeister, J. & Shirin, B. (2000). Thinking differently, learning differently. Educational Leadership, 58(3), 45-48.

Wolfe, P. (2001). Brain matters: Translating research into classroom practice. VA: ASCD,Alexandria.

Zimmerman, B. J. (1995). Self-efficacy and educational development. In A. Bandura (Ed.), Self-efficacy in changing societies (pp. 202-231). New York: Cambridge University Press.